

Coll, and doubtless elsewhere. Much the same seems to apply to *Psylla dudai*, Sulc., and amongst the Coccids to *Chionaspis salicis*, L.

In the Coleoptera the two forms subjected to study are *Coccinella 11-punctata*, L., with its race *boreolitoralis*, Donis., and *Carabus problematicus*, Hbst. The first named insect, when bred in numbers from the Rhum sand dunes, produced forms intermediate between the extreme *boreolitoralis* and the ordinary form, as well as representatives of that race. With *Carabus problematicus*, it is obvious that breeding operations cannot be undertaken. Besides, the problem is of a more complex nature than in other cases discussed. Nevertheless, up to the present, the picture emerging is not out of harmony with that outlined for the other insects dealt with above. However, a programme is being built in which it is proposed to bring under consideration its races from the northern Atlantic islands up to and including Iceland.

It will have been observed that, in reviewing the above species and the races, no mention has been made of clines. The failure to do so has been deliberate, and depends entirely upon the fact that field observations lend no support to the cline theory. Practically every scrap of evidence procurable supports the idea that we are concerned rather with zones of hybridization, occasionally irregularly distributed, developed by the interbreeding of Pleistocene stocks with others whose arrival in the British area can only be dated back to early Holocene times.

Take, for example, *Coenonympha tullia* treated so fully in Ford's *Butterflies* (pp. 292, 293; map 4, p. 342) as illustrating a cline. As far as Great Britain and the Scottish Western Isles are concerned, the map fails to give a correct distributional picture. The insects flying in the Cleveland District of Yorkshire, as well as those encountered in Northumberland, are not true *philoxenus* forms. Indeed, I have individuals in my series from Glaisdale indistinguishable from others taken in Kincardine. Moreover, amongst my Coll captures are some assignable to what Ford considers genuine *tullia*. Again, internal evidence exists in the book proving that that worker realized that the position was not truly that of a cline. In dealing with Islay populations, he is compelled to admit that they include specimens of *scotica*, *tullia* and "even specimens closely approaching *philoxenus*." One cannot wonder, therefore, that he has to write "The population must have evolved on somewhat independent lines." Finally, he attaches too little importance to the distribution of *Philoxenus* on the Continent for it suggests a very recent (probably boreal) advent of that race in Britain.

In conclusion, attention should be directed to the fact that the work outlined above is still in progress and that other reports will appear in future.

VESTRIAS PURPUREUS, THNB., AND ITS PREY.

By DR G. H. LOWE.

This bug preys upon an ant of the genus *Monomorium* closely allied, if not identical, to *Monomorium pharaonis*, L. This ant is very common in Malaya, living in houses. I have never found it in any

*The ant is *Monomorium pharaonis*, L., only the specimens are very pale in colour.—H. D.

other situation. It nests in the cracks of walls, behind the plaster, in the joints of furniture, and similar situations. It does not construct any nest, or alter the nesting cavity in any way. On two occasions I have found nests in a spectacle case, left untouched in a drawer in my dressing table for several weeks. The nests I have seen have contained comparatively small numbers of ants, but numerous nests may occur in one house.

This ant is active throughout the day and night, but during daylight the workers are generally seen singly, unless they are engaged in exploiting some chance food supply. At night long columns of ants run about the walls. Although it nests in perfectly dry situations, it must have water, so that the nests are more common in bathrooms, and in bedrooms where there are hand basins, than elsewhere in the house. Every night columns of ants can be seen running to, and from, the nearest water supply. Other columns run from hole to hole in the plaster walls, or between cracks between the tiles of the bathroom walls. This is a "two-way traffic," and many ants, going in either direction, have distended crops. To the human observer much of this running to and fro seems to be an aimless expenditure of energy.

The large, dark-coloured, dealated females accompany the columns of workers at night, and I have counted six on my bathroom walls at one time. I have not seen winged females, or males, of this species. Perhaps this ant distributes itself by means of branch nests, and the habit of the queens of accompanying the columns would assist in such a method of nest formation. Nesting, as it does, in odd situations, it can easily be transferred from house to house in furniture, and household goods.

A small colony of this ant lived in the joints between the legs and the top of a table in my sitting room at Sungei Patani. A few ants were engaged all day in carrying water supplies to the nest from the flower vase which stood on the table. I had tea at this table, and numbers of ants always appeared to feed on the sugar, and jam, and to carry off small crumbs. Any worker which found food would first fill its crop before returning to the nest. A few minutes after it had disappeared beneath the table a small column of ants would appear following its back-trail to the food. At first there would be some straggling, but a definite trail soon became established. At night a reading lamp stood on the table, and small insects would come to the light. After resting on the globe for some time many of these insects fell on to the table as if overcome by the heat, and the ants came out to carry them off to the nest. Dealated queens often accompanied these foraging parties, but always in a hesitating manner, as if they were uncertain if they should have come with this particular party. The queens took no part in the transport of the food.

This species of *Monomorium* is omnivorous, but it does not seem to attack living adult insects. It will eat ants' eggs, larvae and pupae, but does not attack the adult ants. It has a large sting, but I have never seen it fight. The trails it follows are laid down by scent. If a finger is rubbed across the track the trail is obliterated, and there is much confusion until the trail is re-established across the gap. Food is eaten where it is found, or cut up into small pieces, and brought

home. There is no co-operative effort to bring home larger insects. If a dead insect is small enough to be brought home by a single ant it is carried to the nest, and such help as is occasionally given by a companion appears to be accidental. It is doubtful, however, if it would be any advantage to this ant if large insects were brought back to the nest. The entrance is nearly always too small for large articles to be brought into the nest, and, as it is frequently situated on a vertical wall, it would be very difficult to support a large insect outside the nest whilst it was being cut into small pieces.

Although this ant is common throughout Malaya, except at Hill Stations, I have only seen the bug at the house where I lived at Alor Star, Kedah. Both the larval and adult bugs frequent the trails of the *Monomorium*, particularly at night. The bug appears to be able to see the ants from about half-an-inch away. It makes a few quick steps forward, and a forward lunge with its beak. The ant is generally transfixed through the base of the abdomen, but sometimes the thorax is pierced. The first pair of legs are not used to catch the prey, but they are used to manipulate the ant on the beak just after it has been captured. This manipulation appears to be to keep the ant's jaws, or sting, away from the bug's beak. After a few seconds all movements by the ant cease, and the bug's front legs are then placed on the wall, and the ant remains stuck on the beak. The meal takes from five to ten minutes, and then the sucked-out body of the ant is pushed off, and the bug starts looking for a fresh victim.

If the column of ants temporarily thinned out the bug would move to a fresh area. It appeared to find the ants by sight. The ants never attacked the bug, but, on the other hand, the bug appeared to avoid getting mixed up with the moving column. Stragglers, rather than ants of the main body, were attacked. The ants seem to be quite unaware of the presence of the bug.

Several of these bugs lived on the walls of my bathroom, and the cast skins of the larvae could be found in the angles of the walls. During the daytime the bugs often hid behind the wall fittings, such as the mirror, and I think the eggs must have been laid in these hiding places, as I never found any eggs on the walls. The fate of insects' eggs in the neighbourhood of *Monomorium* would be almost certain destruction. Possibly the eggs are distasteful to the ants, or possibly this bug produces eggs which hatch almost as soon as they are laid. Certainly the larvae were no more numerous than the adult bugs. On one occasion, for instance, one adult, and two larvae, of different ages, were present in my bathroom.

Both larvae and adults are equally voracious. The usual gait of the bug is a deliberate walk. If disturbed they run a few steps, but the adults did not attempt to fly away. I never found them eating anything other than this species of ant, and I never saw one attacking or eating a queen ant. I suggest that this bug is distasteful to the house gecko, which is very common in Malayan houses, and that the striking red and black colouration is a warning. Otherwise such a slow-moving insect, which wanders about on the exposed walls at night, could not hope to survive.